

THE EVOLUTION OF 21ST CENTURY ACQUISITION AND LOGISTICS REFORM

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The United States has changed its military strategy and stepped up the use of its existing military forces without a major defense budget increase. A host of new initiatives are under way to generate the cost savings necessary to continue force modernization without a major budget increase. Reforms so far have primarily focused on the acquisition and logistic parts of the problem. Financial, contractual, and sustainment reforms are needed in order for acquisition and logistics reform (ALR) to achieve its full potential.

Joint Vision 2010 (Shalikashvili, undated) has outlined a significant change in U.S. military strategy. It describes a transition from a forward-deployed force (with stockpiles of materials and permanent troops located in anticipated trouble spots) to a largely CONUS-based force with a power projection capability (achieved through rapid strategic mobility and reduced logistics tails). Scenarios in which U.S. forces are deployed have expanded from major wars to a broad range of deterrent, conflict prevention, and peacetime activities—in concert with our friends and allies in almost all operations. The Joint Chiefs of Staff (JCS) Focused Logistics Roadmap integrates a host of initiatives (rapid distribution and response, total asset visibility, information fusion, etc.) designed to

improve logistics for the warfighter in support of *Joint Vision 2010*.

Defense acquisition reform efforts are under way to cope with this change in military strategy. Due to the high cost of supporting existing systems, the “spill-over” of acquisition reform into the logistics arena was a natural follow-on. It seems as if more Department of Defense (DoD) logistics changes have been proposed in the past three years than in the previous 30 years; some say that we’ve just “scratched the surface.” The Section 912(c) DoD Product Support Reengineering Implementation Team, in its July 1999 *Product Support for the 21st Century* report, identifies 300 DoD logistics and product support initiatives (Gansler, 1999).

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In recognition of the inseparability between ALR efforts, the fiscal year (FY) 2000 National Defense Authorizations Act changed the title of the Under Secretary of Defense for Acquisition and Technology to the Under Secretary of Defense for Acquisition, Technology and Logistics (USD (AT&L)).

CURRENT DEFENSE NEEDS

Current U.S. defense needs require both increased operations and continued modernization. The classical, relatively easy approach to achieving the need has been to increase the defense budget. Contemporary political pressures, however, have forced the search for more economical alternatives.

One alternative that immediately comes to mind is to prioritize and limit operations. This will immediately reduce logistics costs—the greatest component of the defense budget. Yet, as Representative George R. Nethercutt, Jr. (1996) observed in *National Defense*, “The Defense Department has been involved in more deployments in the past 7 years than during the entire Cold War.” General Erik Shinseki (Chief of Staff, Army), in a February statement before the House Armed Services Committee, observed that “Since 1989, the average frequency of Army contingency deployments has increased from one every 4 years to one every 14 weeks.”

Maintaining near-term readiness of existing systems while continuing modernization efforts and reducing infrastructure remains a serious challenge. DoD requests for additional base realignment and closures (BRACs) have yet to happen. Current operating tempos dictate that

current operations take precedence over future modernization. Therefore, it was no surprise that the Joint Aviation Logistics Board (JALB) June 1999 report on *Commercial Support of Aviation Systems* states that discretionary procurement accounts dropped by 53 percent since 1990, while operations and maintenance activity declined by only 15 percent (Joint Aeronautical Commanders’ Group, 1999). This is effectively delaying replacement of existing systems.

Secretary of Defense William Cohen, in the May 1997 *Report of the Quadrennial Defense Review*, observed that “Today, the Department is witnessing a gradual aging of the force.” This lends credence to the statement in a 1994 issue of *Army RD&A Bulletin*: “In actuality, our military hardware is now on a replacement cycle of about 54 years—this in a world where technology typically has a half-life from 2 to 10 years” (Augustine, 1994).

Figure 1 shows that total operating and support costs (for U.S. Mail processing automation equipment whose annual support costs equal approximately 18 percent of acquisition cost) are service-life dependent and can approach 98 percent of total life-cycle cost (LCC) if the equipment is kept in service for 54 years. Thus, any DoD efforts to reduce LCC must establish operations and support as a prime consideration in designing a new system or improving an existing system.

The 53 percent drop in procurement over the last 10 years has significantly weakened the Defense Industrial Base. Northrup Grumman chief executive officer Kent Kresa stated in March that “The trouble with our industry is, we have virtually nothing new. Where we used to have a new [Pentagon weapons system]

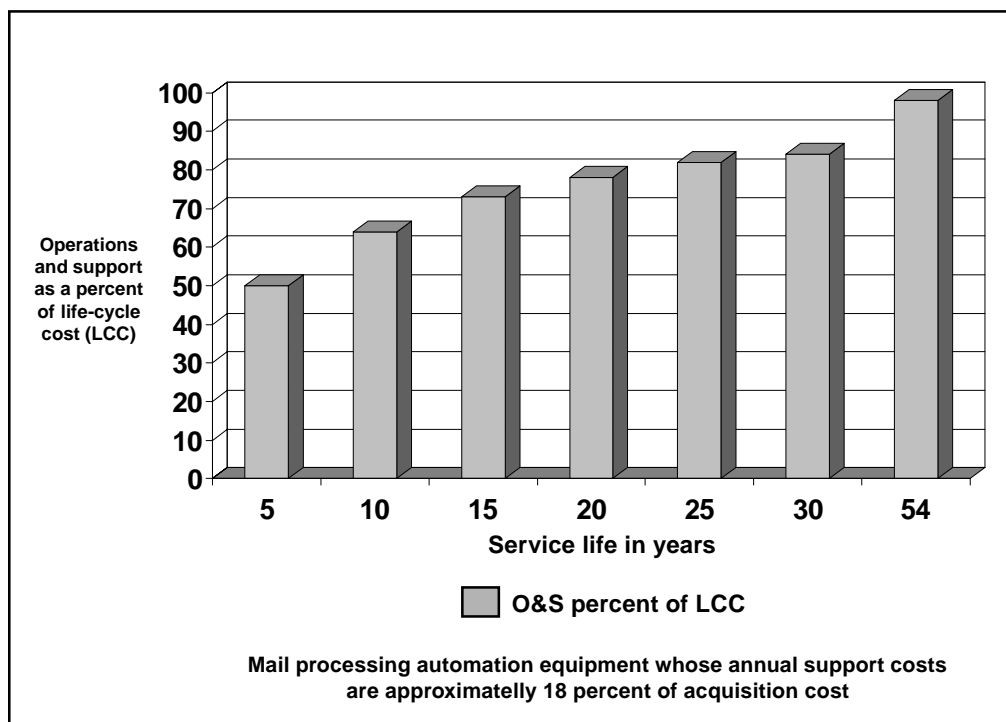


Figure 1. O&S is Service-Life Dependent

coming along, a major system, every year or every other year, now we're talking about every decade. Maybe every two decades... And if you happen to be an airplane builder, once the Joint Strike Fighter gets finished, what's next? So how do you [attract] the young person who wants to build airplanes, who'll never have an opportunity in his lifetime to build an airplane?" (Schneider, 2000).

One response to this gradual decrease in modernization is to exhort managers to "do more with less." But you simply cannot do more of the same with less; you either do more with more, or less with less. The remaining alternative is to change procedures and processes to increase efficiency and effectiveness.

CURRENT INITIATIVES

Acquisition and logistics reform deals with the modernization dilemma by changing procedures and processes to increase efficiency and effectiveness. Non-value-added effort is eliminated. The goal is to free funds to accomplish needed modernization. Craig Olson, in a spring 2000 *Acquisition Review Quarterly* article, states that the challenge simply cannot be met short of a revolutionary change in the present acquisition force structure. *DSMC Press Technical Report TR-1-99* states that it is too early to measure the success of acquisition reform (Reig, Gailey, Swank, Alfieri, and Suycott, 1999). Only projections can be made at this point.

Official DoD Photo



The B-52H of the 20th Bomb Squadron "Buccaneers" from the 2nd Bomb Wing, Barksdale, Louisiana.

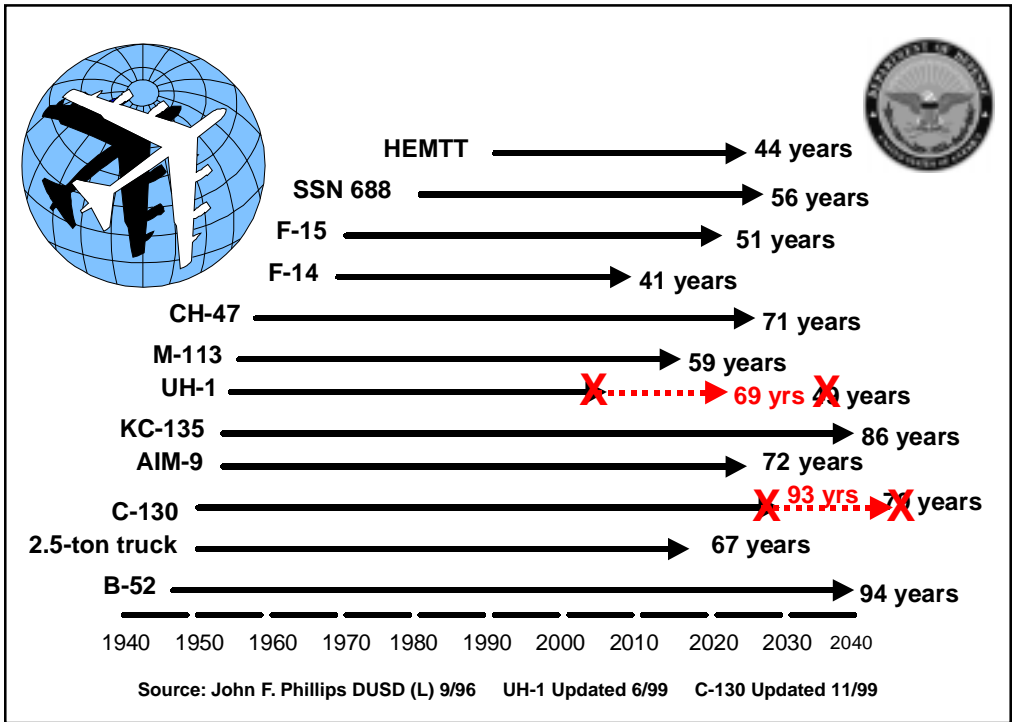


Figure 2. Defense System Life Cycles

To adequately address ALR, we need to adopt a representative time. This time perspective is the entire system life cycle, which spans research, development, test and evaluation, manufacturing and production, deployment and materiel fielding, operations and support, modifications and product improvements, and ultimate disposal, recycling, or demilitarization of the system.

Figure 2 illustrates this time perspective for a number of representative defense systems. The system life cycle equals acquisition time (the time from conception of a weapon system through the initial deployment of a small quantity) plus service life (the time from initial operational capability to disposal, demilitarization, or recycling of the last system). Jacques Gansler,

in *Affording Defense*, observes that acquisition time varies in the range of 11 to 19 years. By assuming a 15-year acquisition time and a 54-year service life, a representative time perspective for defense systems can be defined as approximately 70 years. Some systems, such as the B-52 and C-130, have projected system life cycles in excess of 90 years.

THE DoD LOGISTICS STRATEGIC PLAN

In August 1999, Jacques Gansler USD (AT&L), promulgated the year 2000 edition of the *DoD Logistics Strategic Plan* to modernize our logistics systems and improve support of our 21st century warfighters.



Official DoD Photo

A US Marine C-130 "Hercules" performs a refueling mission during an Air and Amphibious Beach Assault exercise.

Logistics redundancy and duplication are time-honored—albeit inefficient—methods used in the past to support acquisition of some state-of-the-art equipment that has been largely “long on performance, but short on supportability.” Although multiple examples of cost-effective defense systems exist, the fact is that logistics accounted for 64 percent of fiscal year 1997 DoD total obligation authority (or its new synonym: DoD total ownership cost).

Gansler expressed his dissatisfaction with this current state of affairs in a January 20, 1999, letter (“Into the 21st Century: A strategy for Affordability”). He set a goal to reduce the funding required by logistics from 64 percent of total obligation authority in fiscal year 1997 to 62

percent by fiscal year 2000, to 60 percent by fiscal year 2001, and a stretch target of 53 percent by fiscal year 2005. To achieve this requires a wholesale recognition that operations and support represent a significant cost driver which requires prime consideration early and throughout the design and development of a new or improved defense system.

SHORTCOMINGS OF CURRENT MEASURES OF SUCCESS

In wartime, the cost of weapon systems has historically remained a secondary issue. The United States traditionally provides what it takes to support our troops. During extended peacetime, however, the



Official DoD Photo

Aviation Ordnancemen load an AIM-9 “Sidewinder” missile on an F/A-18 “Hornet” attached to the “Rampagers” of Strike Fighter Squadron Three on the flight deck of the aircraft carrier USS *George Washington*.



A KC-135 follows a lead vehicle back to the Alpha ramp at Grand Forks Air Force Base, N.D. for a regeneration sortie and aircrew servicing.

cost of defense systems tends to dominate debate. Myopic views of cost result in an excessive focus on yearly expenditures (the current budget) for defense programs. A broader strategic perspective involves the use of LCC.

The other measure of defense systems success is effectiveness when used. Despite the fact that the majority of a defense system's life cycle is spent in peacetime, we must design weapon systems for the worst-case environment—war. But war is the world's most uneconomical undertaking.

If we combine the two measures above, the “bottom line” of all improvement efforts can be summed up as cost-effectiveness. But cost-effectiveness is a judgment call—a subjective versus objective

measure. This ensures that continued controversy will remain an integral part of the defense acquisition process now and in the future.

THE WORST AND BEST PRACTICES – A COMPARISON

The best illustration of new ALR efforts is to compare the “worst practices” of the 1960s through the 1980s with the “best practices” (including ALR initiatives) of the 1990s through 2010 and beyond. Figure 3 illustrates this comparison over a 70-year lifespan, including each “cradle-to-grave” year drawn to scale. This is the time needed to demonstrate

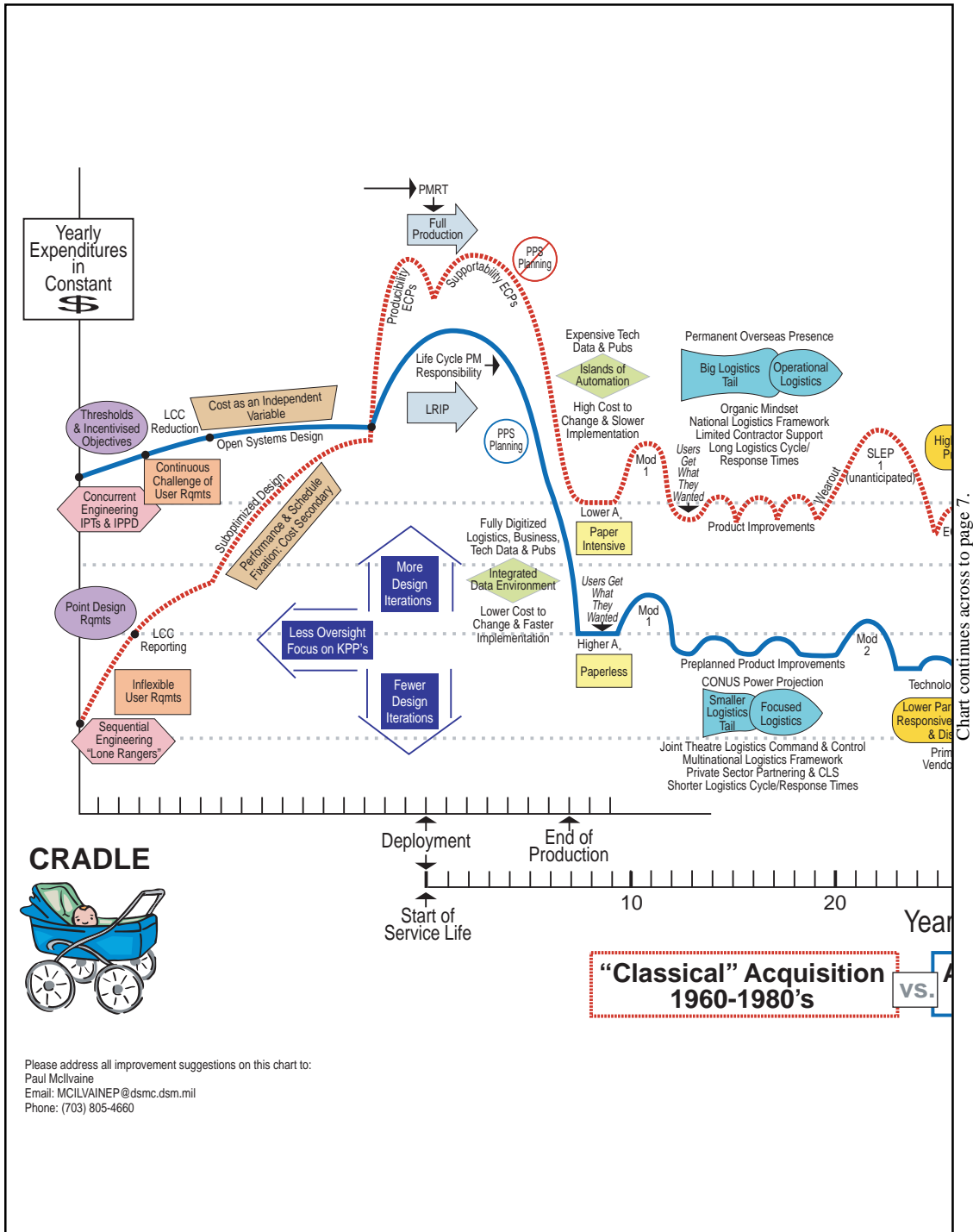


Figure 3.
21st Century Acquisition and Logistics Reform for a Typical Program

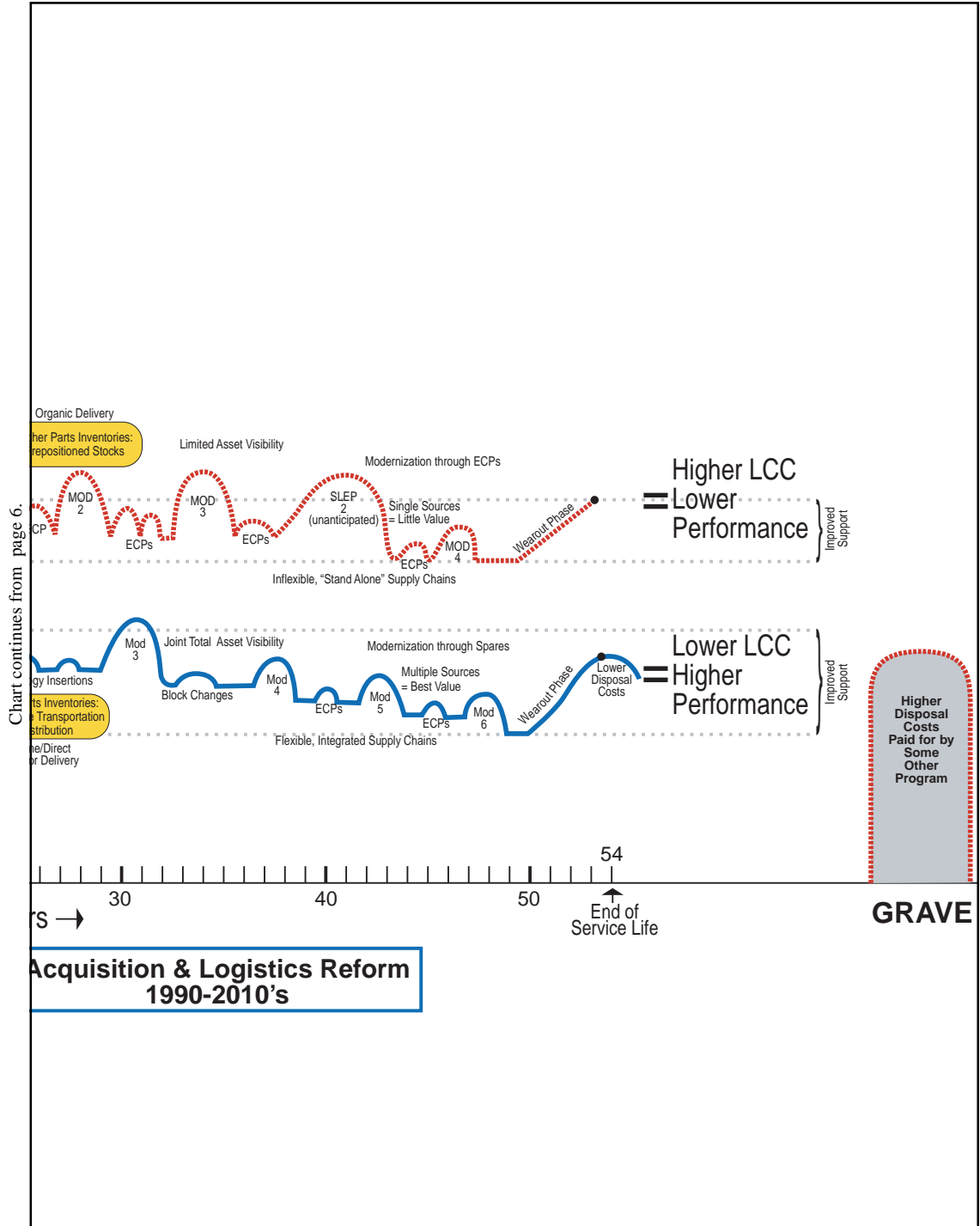


Figure 3 (continued).
21st Century Acquisition and Logistics Reform for a Typical Program

how well today's ALR efforts achieve their objectives.

The ordinate represents yearly expenditures on a constant dollar basis. Thus, Figure 3 as a hypothesis only addresses the economic success of ALR. By following the money from cradle-to-grave, we can illustrate the economic success of a "reformed" program, in which identical system effectiveness is assumed. Consequently, the measure of the economic success of ALR is minimizing the area under the curve (LCC—or its new synonym, defense systems total ownership cost).

THE WORST PRACTICES OF THE 1960S THROUGH THE 1980S

The engineer in the 1960s through 1980s could be dubbed "The Lone Ranger." This engineer practiced the art of sequential engineering: First, design a system to work and meet or exceed all point design requirements. LCC—a minor concern—was dutifully reported as the

"The engineer in the 1960s through 1980s could be dubbed 'The Lone Ranger.'"

result of design. Subsequently, design engineers addressed manufacturing and producibility.

If "show-stopping mistakes" were identified (such as designing a wing 2 inches longer than the largest fixture in the tool inventory), then a redesign or engineering change was made, requiring more money and time.

Logistics considerations then followed, demonstrating the attitude that the "loggies" would simply support whatever the design engineers created. Their measure

of worth was dealing with shortsighted design decisions, and keeping systems (no matter how good or bad) running in the field. If show-stopping mistakes were identified (such as inaccessible parts requiring periodic replacement), then a redesign or engineering change was made, again requiring more money and time.

Following this path, the next major item was deployment—the system was turned over to the user. The user's last involvement with the program was in the "front end" requirements determination. User point-design requirements were considered inviolate and further discussions with users, or "challenges" of questionable user requirements during development, were frowned upon. If the user identified a show-stopping mistake upon receiving the deployed system (such as a nonwaterproof system targeted for exposed storage), then an engineering change was incorporated, again requiring more money and time. Alternately, if the change was not made, then the tactical and operational logisticians were sent scurrying to find unplanned, unbudgeted, covered-storage space for the system. And eventually, after a number of changes or other accommodations (collectively called MOD 1 or the A Model), the user got what the user wanted—sort of.

The steps in sequential engineering could be dubbed re-engineering or, better yet, "getting it right the second, third and fourth times." Too often, the downstream result was lower operational availability [readiness] at higher cost.

This paper-intensive, iterative process resulted in "islands of automation" for each functional discipline, a high cost to change, and slower implementation. A general defense "rule of thumb" was that



An M-113 ambulance of the 1st Armored Division on a trail near site "Gator," Bosnia-Herzegovina.

technical manuals averaged \$1,000 per paper page to change or update. During visits to operating bases, I personally observed maintenance technicians with handwritten notebooks in which they documented their "tricks of the trade." These notebooks helped them to better deal with problems that were inadequately described in the official technical manuals or ignored by the designers.

After deployment, the program manager executed a "program management responsibility transfer" to another organization, usually identified as a "logistics command" or equivalent. And the original program management team returned to new system development to again repeat the process. The receiving command then performed the function of program management—often mislabeled as "logistics management"—for the remainder of the system life cycle.

This mislabeling was due to the one certainty in acquisition—constant change. Program management of a brand new system includes the functions of design, test, production, fielding, operations and support, and eventual disposal. Logistics management primarily centers on the function of support or sustainment. After deployment, a defense system will certainly face change. Modifications include the functions of design, test, production, fielding and installation, operations and support, and eventual disposal—virtually identical functions of program management. Thus, the art and science of program management is the one function consistently performed throughout the entire system life cycle for both new starts and modifications to existing systems.

Systems produced via sequential engineering usually needed long, big, logistics tails to compensate for design short-

comings. An organic mindset usually permeated all logistics thinking and planning. The politically correct language to describe contractor support was “interim contractor support”—even if it lasted for decades. Higher parts inventories were pre-positioned within “arms length” to compensate for long logistics cycle and repair times (with great distance between places of use and repair). Organic deliv-

“Systems produced via sequential engineering usually needed long, big, logistics tails to compensate for design shortcomings.”

ery had to wait its turn as a “competing priority.” Limited asset visibility confused and obfuscated logistics efficiencies by people

not knowing where a part was in the pipeline or warehouse, or its condition. Supply chain management under this scenario is and was haphazard and inefficient. The net result was usually lower operational availability (synonym: readiness) at a greater cost.

But the popular method to deal with low operational availability and high costs was to change the system. The quest to redesign is aptly named. The goal was to make the system do what it should have done in the first place. Unplanned product improvements and engineering change proposals were legion—especially as new technology allowed both performance improvement and support improvement.

As time marched on, however, the system eventually entered the wearout phase—the end of its service life. Many sequentially engineered systems were designed for service lives of 15 or 20 years, at which point the replacement systems

were planned to arrive and allow smooth transition from old to new systems before the added costs of wearout. This planning optimism could result in disappointment if replacement systems were still mired in the early acquisition phases—years from deployment. In this case, the only practicable alternative was to institute an unplanned service life extension program (SLEP). This could prove quite costly if the system was not originally designed for rebuild—as in many cases.

But given enough time and money, “anything could be accomplished.” Besides, the political visibility of modification programs has traditionally been less than new starts. Thus, the A model, B model, etc., became the modernization norm as technology continued its inevitable march forward. With increased service lives becoming commonplace, at least one or two unplanned and expensive SLEPs could be expected for many typical legacy systems. Gansler, in *Affording Defense*, speaks of the “...tradition of keeping equipment in the field approximately twice as long as it was initially planned...” (1989).

After production termination (postproduction support), one of the major downsides of new technological improvement became evident. Sole source suppliers of unique spare parts for legacy defense systems that were no longer in production faced higher costs to produce fewer quantities when orders fell. Thus, suppliers were faced with decisions to either raise costs and keep their spare parts production lines open, or embrace new technology and cease production of the older technology. With little or no post production support planning—evidenced by sole sources of supply, high costs, slow

response times, and the like—the government was often faced with reverse engineering of replacement parts, life of type buys, unplanned depot overhauls, or system redesign. Advantages gained by improved technology (even with logistics benefits) could be more than offset by the difficulty of changing systems that were not designed for easy change.

Eventually, all systems reach the end of their economic or physical service lives, when replacing the system represents the most cost-effective alternative. Disposal of the legacy system is then addressed—usually for the first time. Museum donations, foreign military sales, retirement to Davis-Monthan Air Force Base, etc., represented relatively easy solutions to the problem.

Hazardous materials used in the original design of the system presented special problems. If additional monies could be found for this unplanned activity, proper disposal of hazardous materials was feasible. Shortsighted solutions to the problem involved burial in remote parts of military bases, burial at sea, or other environmentally unfriendly alternatives that are no longer acceptable. However, this previous practice allowed a quick, cheap, and easy end to the system as the program was terminated. Decades later, the legacy of shortsighted hazardous materials disposal became evident. But with no program around, it was likely that somebody else would have to bear the cost and danger of cleanup.

This rather pessimistic view indeed represents a compilation of “worst practices” for a theoretical program. In the early 1970s, my engineering supervisor once told me to “get real” and stop creating controversy and delay by trying to design

it right the first time. He said the only way to build a defense system was to spend the money quickly, or some other program would “steal” it. If the design wasn’t quite right the first time, you would eventually get the money and commitment to fix it later!

Unfortunately, the wisdom in his comments reflected the inflexibility of DoD’s financial systems and the incentives and rewards in place at the time. Despite these shortsighted incentives, many programs in the 1960s through 1980s used dif-

“Eventually, all systems reach the end of their economic or physical service lives, when replacing the system represents the most cost-effective alternative.”

ferent methods and better practices. These are the defense systems that are still in service today. Longevity is (and remains) the bellwether of a good system design.

THE BEST PRACTICES OF THE 1990S THROUGH THE 2010S

Choices characterize the “front end” of modern acquisition practice. Computer-aided design, manufacturing and logistics tools allow faster computation of design tradeoffs, assessment of design alternatives, and completion of design—compared with previous manual practices. But these modern tools can be used in two ways:

COMPLETE THE PROCESS FASTER AND AT LOWER FRONT-END COST

Alternative 1 yields the most immediate and measurable results and is the

objective in stated goals to reduce cycle times. But the *DSMC Press Technical Report TR-1-99* states that the pre-1989 average duration of the engineering and manufacturing development phase was 6.5 years, rising to 8.7 years during the period 1993–1996, and dropping to 8.3 years in 1997 (Rieg et al., 1999). This data could lead to a conclusion of limited progress to date.

COMPLETE THE PROCESS AT THE SAME SPEED AND COST, BUT BETTER

Alternative 2 is to complete the process in the same amount of time (by pursuing additional design iterations to yield a higher quality and reduced risk design)

and at the same front-end cost (by reinvesting any front-end savings in high pay-off areas for downstream cost reduction).

Alternative 2 has the potential to yield even greater LCC savings. This alternative makes comparisons much clearer, and it is depicted in Figure 3. If Alternative 1 were depicted, the gray line in the chart would move to the left (reduced cycle time) and move down (reduced front-end cost). Reduced oversight would have the same effect.

Since the one certainty in all of acquisition is constant change and inevitable technological progress, open systems design has emerged as one of the most intelligent design innovations in decades.



UH-1 Huey helicopters from the 37th Helicopter Flight prepare to land in a field during a simulated Launch Facility (LF) Recapture Exercise.

Open systems design recognizes that change is inevitable and seeks to establish system architectures and system designs with the flexibility and partitioning to facilitate future change to the maximum extent practicable. Where needed technologies have not yet matured, preplanned product improvements and technology insertions can be more easily implemented downstream with open systems design. This technique should prove to be of great benefit to systems design, production, and logistics support.

The engineer in the 1990s through 2010s could be dubbed “design team leader” or “systems engineer.” This modern engineer practices the art of concurrent engineering (systematic consideration of all elements of the system life cycle—including manufacturing and support—from the beginning). Integrated product and process development (IPPD) is the predominant technique that simultaneously integrates all disciplines through the use of multidisciplinary teams in each area that ultimately has a hand in the acquisition and design process. This includes software engineers, production engineers, logistics engineers, test engineers, reliability engineers, contract specialists, financial managers, LCC analysts, user representatives, business managers, contractor personnel, and others.

The goal is a producible, supportable, cost-effective design that satisfies user requirements at the lowest practicable LCC. The objective is to “get it right the first time” through a series of design iterations—each of which yields a higher quality design. What we call show-stopping mistakes should be rare, since all participants in the process are team members from the outset.

Inflexible point design requirements have been replaced with thresholds (minimum acceptable values) and objectives (a more desirable value to work toward). This range of acceptable values allows enhanced design flexibility in making reasoned trade-offs. Greater user involvement in all phases of the acquisition program allows continual dialogue and “challenge” of user needs to foster more intelligent design decisions.

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Cost as an independent variable (CAIV) methodologies are used to acquire affordable DoD systems by a better balance among performance, schedule, and LCC. Tradeoff analysis is repeatedly applied throughout the system life cycle as the key tool that results in LCC reduction—not just reporting.

The tendency of keeping defense systems in service at least twice as long as initially planned can be dealt with by more realistically designing systems for longer service lives or designing systems for periodic rebuild (if more cost-effective). Costly, unplanned service life extension programs can be radically reduced. Open systems design is expected to make modifications, technology insertions, and product improvements less expensive and faster to implement.

The measure of the worth of logisticians is no longer how well they deal with easily avoidable downstream problems (reactive problem solving). Proactive problem prevention is the primary goal and focus of the acquisition logistician.



Heavy Expanded Mobility Tactical Truck (HEMTT)

Problem solving for the tactical-operational logistician will never entirely disappear, but will be reduced to manageable proportions, due to greater logistics attention in the front end of the process.

Producibility and supportability Engineering Change Proposals (ECPs) are drastically reduced as a result of the continuous involvement of producibility engineers and acquisition logisticians from the outset of the program.

The entire acquisition process will be tied together via an integrated data environment that allows all users real-time access to the data they need. Enhanced communication among program participants facilitates improved management. Lower cost to change documents and faster implementation (a.k.a. reduced cycle time) should become the norm, because of this paperless process.

As a result of continuous user involvement in the program, deployment can be expected to be much smoother. The user knows what to expect from the system and the developer knows how the user will operate and support this system.

The Section 912(c) report on *Program Manager Oversight of Life Cycle Support* identified 30 pilot programs to test the concept of the program manager assuming life-cycle system responsibility (PMOLCS Study Group, 1999). Presuming success, the program manager of the future can be expected to retain the life-cycle responsibility for the system subsequent to deployment. Field commanders and users will most likely continue their responsibility for the *present*—i.e., the readiness and sustainability of the fielded system. The program manager can be expected to assume responsibility for the

future—i.e., improvement of the system (to include the operational subsystem and the logistics support subsystem).

Systems designed and produced via concurrent engineering or IPPD usually need shorter logistics tails to accompany high quality designs. Partnering arrangements with industry for long-term life-cycle contractor support—governed by sensible “win-win” business relationships—will replace the “organic mindset.” Necessary organic support is still retained for those functions defined as core.

Total asset visibility (TAV) provides users with timely and accurate information on the location, movement, status, and identity of units, personnel, equipment, and supplies. This tremendously increases logistics efficiency and supply chain management because all players in the process know where each part is (pipeline, warehouse, contractor plant, etc.) and in what condition each part is (ready for installation, undergoing repair, etc.). Rapid transportation and distribution (coupled with prime or direct vendor delivery) results in lower total parts inventories and improved logistics responsiveness. The net result will be higher operational availability (readiness) at lower cost.

Mutually acceptable measures of effectiveness (MOEs) in a performance-based environment are the basis upon which sound business relationships and partnering agreements are built. Defense contractual arrangements in the future will de-emphasize units repaired per month, inventory quantities, etc. New defense contractual arrangements will evolve to performance-based logistics in which we buy operational availability or customer wait time and mean logistics delay time.

Costs per operating hour is another MOE, common in commercial industry, that can be expected to see increased Defense use in the future. Incentivization of improvements to systems and subsystems will be the norm in which contractors can reap additional profit by delivering added amounts of “goodness” in systems.

A single maintenance data collection system among all the services must evolve in order for ALR to reach its full promise. Accurate and timely field data is the cornerstone upon which sustaining engineering efforts assess current fielded system effectiveness and address prioritized improvements to both the system and its support.

As systems age, multiple sources of supply are still available because fewer single-source, single-application subsystems and components were used in the basic system design. Modernization through spares (MTS) is a strategy of technology insertion and the use of commercial products, processes, and practices to extend a component's useful

life or improve its reliability. MTS can extend a defense system's useful life by dealing with the problem of newer

technology supplanting the older technology in legacy defense systems. Good, solid post-production support planning will not preclude all modernization and supply problems, but instead will reduce the remaining problems to manageable proportions.

“ Systems designed and produced via concurrent engineering or IPPD usually need shorter logistics tails to accompany high quality designs.”

As the system enters the wearout phase, disposal plans are put into action and disposal budgets are executed. Fewer hazardous materials should be used in the original design. Disposal planning for those that were used can be updated before the system is ultimately disposed.

This rather optimistic view represents “best practice.” In about 70 years (the life cycle for the average defense system), we will be able to accurately measure the results of today’s ALR efforts.

SUMMARY

Exhortations for government to “adopt commercial methods” and “do it like industry does it” are common. The Section 912[c] report on *A Plan to Accelerate the Transition to Performance-Based Services* reiterates the future projection that “Government acquisition spending will continue to be used to foster socioeconomic

goals” (Anderson, 1999). But the report goes on to observe that “Because the goals of a DoD source selection differ from those in a commercial source selection, the most

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aggressive commercial methods are not appropriate for DoD use.” Thus, industry has different goals, fewer constraints, and more flexible financial systems that are, in many ways, less burdensome than those used by government. Industry does not always do it faster, cheaper and better than

government—a more accurate statement might be that industry does it differently than government.

“Pay me now or pay me later” remain the chief options in DoD acquisitions. Past defense acquisition systems tended to incentivize the “pay me later” option—evidenced by the high cost of operating and maintaining our existing systems. Defense ALR efforts are simply asking for a more reasoned tradeoff among the “pay me now or pay me later” alternatives for future systems, while we struggle with the legacy of our past decisions.

Best commercial practice involves giving good program managers a clear job with wide latitude, minimal oversight, and considerable flexibility in making investment decisions in their commercial product programs, while holding them accountable for results. Investing “up front” monies to avoid “downstream” expenditures must always be the subject of a serious business case analysis resolved through tradeoff decisions involving a long-term perspective. Government program managers for defense programs need that same latitude, flexibility, and accountability.

ACQUISITION AND LOGISTICS REFORM (ALR) RECOMMENDATIONS

Acquisition and logistics reform efforts to date have made considerable progress and hold great promise. However, much work remains to be done in order to achieve the full potential of these reforms. Below are six areas where improvements can be made.

First, government contracting tools need to change to reflect the new reality. DoD Directive 5000.1 and DoD Regulation 5000.2-R direct that long-term, life-cycle contractor support is the preferred

method of logistics support. The JALB Report *Commercial Support of Aviation Systems* cites the framework of the *World Airlines and Suppliers Guide*: The maximum parts cost guarantee is an agreement whereby suppliers provide a parts cost (Joint Aeronautical Commanders' Group, 1999).

To adopt this standard commercial practice in government may be viewed as limiting competition. Long-term, life-cycle contractor support requires innovative multiyear service contract arrangements, possible statutory changes, and logistics contractual strategies that encompass longer defense service lives (54 years, for example). In current practice, government contracts are of much shorter duration and can hamper government program managers from more efficiently executing life-cycle responsibility.

Second, a long-term financial perspective (approaching 54 years) is necessary to implement ALR. The planning, programming, and budgeting system (PPBS) is the Defense Department's financial system that provides the "fuel" to make ALR work. But the PPBS looks forward about six years at most. Paul Mann, in *Aviation Week and Space Technology* (2000), observes that "...unsynchronized Pentagon/congressional budget cycles, result in artificial cost projections and an acquisition culture of intellectual dishonesty." Thus, government financial reform has not kept pace with ALR efforts.

Third, government program managers who can obtain a great return on investment of "up front" RDT&E monies to significantly reduce downstream operations and maintenance (O&M) monies are still thwarted in their attempts to make serious tradeoff decisions. "Colors of money"

and the intractability of the current PPBS may defeat a compelling government business case analysis for up-front investment to greatly reduce downstream expenditures. A commercial producer would readily adopt this same business case analysis. Procedures that allow program managers to retain and reinvest savings (or portions thereof) in their programs are needed. In today's environment, government program managers are still incentivized to minimize expenditure of scarce RDT&E and procurement funds; i.e., their current budgets—not optimize LCC.

Fourth, commercial practices and use of commercial or nondevelopmental items, if properly applied, are great methods of improving processes and reducing costs. Commercial practices are different from defense practices, however, and usually involve shorter life cycles with

" 'Colors of money' and the intractability of the current PPBS may defeat a compelling government business case analysis for up-front investment to greatly reduce downstream expenditures."

little customer control. So customers must have the flexibility to react to the market decisions of their commercial suppliers. For example, when a commercial supplier decides that new technology no longer makes it cost-effective to support a legacy system, customers are forced to either set up their own logistics support or replace their older systems with the latest technology.

But the government financial system dictates the use of different colors of

money for each alternative. If the government program manager expected the technology cycle to be longer and budgeted operations and maintenance monies to support a legacy system, these budgeted

“It takes time to spend money wisely; but, in the current environment, slower, wiser spending is impracticable.”

monies (even if adequate to replace the older system with the latest technology) cannot be used to finance procurement of the latest technology

system. They can only be used to operate and maintain the older system. This current state of affairs will often force government program managers into “short-sighted” and uneconomical decisions dictated by an inflexible PPBS, rather than by logic.

Fifth, “haste makes waste.” When constant defense budget turbulence threatens to decrease or eliminate needed program funds, Industry reacts by hesitating to make any long-term capital investment in the program. Program managers react to this financial instability by hurrying to spend monies before another budget cut. It takes time to spend money wisely; but, in the current environment, slower, wiser spending is impracticable. An old friend and colleague of mine (currently serving as a government program manager) recently commented that the most common question he is asked at reviews is “What are your obligation and expenditure rates?”

This budget turbulence is not limited to DoD. A front page *Washington Post* article on a lost Mars polar lander stated that “... NASA’s efforts to tighten the budget screws and encourage certain kinds of

risk taking—under a philosophy known as ‘faster, cheaper, better’—finally went too far” (Sawyer, 2000). “...Managers may have failed to raise alarms more clearly up the chain of command because of concern that they would lose ground in the competition for tight funding...”

Sixth, past inattention to the sustainment and maintenance (operations and support) phase of the system life cycle has clouded the objectives of this phase: readiness and sustainment of the system, and improvement of the system (to include the operational subsystem and the logistics support subsystem).

In-service engineering analysis of fielded systems performance is hampered by “islands of automation” (that inhibit the free flow of information) and unique maintenance data collection systems that have evolved for each service. Greater program management, engineering, and logistics resources and attention devoted to this area will result in decreased LCC. Improved maintenance data accuracy, better data collection and dissemination efficiency, enlightened data reduction and analysis, prioritization of engineering improvements with both operational and logistics benefits, and better visibility into product support costs and logistics effectiveness are prerequisites to executing modern program manager life-cycle responsibility and achieving the objectives of this phase.

CONCLUSION

Much effort has been expended on ALR. Government financial systems, however, have not been reformed, and currently support the old way and worst

practices in doing business. Thus, ALR efforts will fail at worst and stumble at best under the statutes, policies, processes, precedents, and procedures of the current financial systems applicable to defense in the legislative and executive branches of government. Financial reform, contractual innovation, and other changes to provide

defense program managers greater flexibility in the expenditure of funds and greater incentivization to minimize LCC is sorely needed to complete the transformation of the DoD acquisition and logistics system from the 20th to the 21st century.



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